ABSTRACT

The Hough Transform is a computer vision algorithm that can robustly detect a wide variety of features such as lines, circles, and anything else that can be readily parameterized or otherwise cast in terms of a discrete popularity algorithm. Unfortunately, not all processors or like devices are capable of providing the requisite processing capability usually associated with the Hough Transform. The methods and arrangements presented herein leverage the dedicated hardware of a graphics card to provide a portion of the data processing. This is done by: in a pre-processing step, gathering observations that can be mapped into a parameter space of a desired feature or features; then, quantizing the parameter space of the desired feature(s); for each discrete quantized parameter combination, allocating a accumulator and initialize it to 0; for each observation, incrementing all of the accumulators that correspond to parameter combinations that might have produced the observation; and finding maxima in the quantized parameter array. This last step is a post-processing step that is completed by dedicated graphics hardware having an alpha-blending capability programmed to find maxima, i.e., record votes associated with the Hough Transform.